

SAGE IV Pathfinder

Completed Technology Project (2016 - 2017)

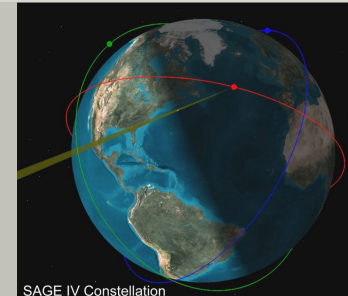


Project Introduction

Utilizing a unique, new occultation technique involving imaging, the SAGE IV concept will meet or exceed the quality of previous SAGE measurements at a small fraction of the cost. The results of two Engineering Design Studio (EDS) sessions already held at NASA Langley have been used to finalize a mission design, and a ROSES Instrument Incubator Program (IIP) proposal has been submitted. Preliminary hardware and embedded control firmware and software development is currently underway. Of particular importance is a rework and finalization of the telescope design, which was deemed to be insufficient with respect to stray light mitigation after the EDS. The SAGE IV telescope design work is currently under contract to Quartus Engineering (forward funded from FY16 resources) and will be completed by the end of January 2017. We will also finalize work related to a laboratory demonstration of the filter wheel mechanism. Some resources are required to continue to support critical work and personnel at NASA larc between the start of FY17 and the anticipated start of an IIP effort. Under an IIP, a fully functional SAGE IV Pathfinder ground demonstration unit will be developed and built with CIF/IRAD having played a pivotal role in enabling this innovation and future mission.

Anticipated Benefits

The Clean Air Act mandates NASA to maintain observations of atmospheric ozone. Additionally, accurate records of stratospheric aerosols are a vital piece of the puzzle regarding climate change. Reliable long-term measurements will require increasing access to and reducing the cost of frequent spaceborne missions. The best measurements have been and continue to be delivered via expensive, single instruments (e.g., SAGE II and SAGE III ISS to be launched in 2016). Ultimately, a relatively inexpensive SAGE IV space-based instrument will be used to monitor stratospheric ozone and aerosols. Our current instrument and mission designs are being driven by conformance to the 6U cubesat form factor.



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

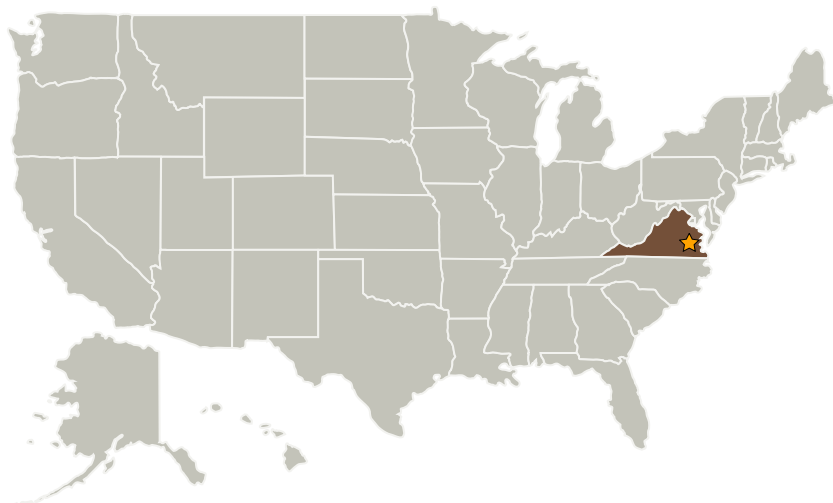
Center Innovation Fund: LaRC CIF

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Primary U.S. Work Locations and Key Partners



| Organizations Performing Work | Role | Type | Location |
|----------------------------------|-------------------------|---|-----------------------|
| ★ Langley Research Center (LaRC) | Lead Organization | NASA Center | Hampton, Virginia |
| Blue Canyon Technologies, LLC | Supporting Organization | Industry | Boulder, Colorado |
| Quartus Engineering | Supporting Organization | Industry Small Disadvantaged Business (SDB) | San Diego, California |
| Teledyne Technologies, Inc. | Supporting Organization | Industry | |

Primary U.S. Work Locations

Virginia

Project Management

Program Director:

Michael R Lapointe

Program Manager:

Julie A Williams-byrd

Principal Investigator:

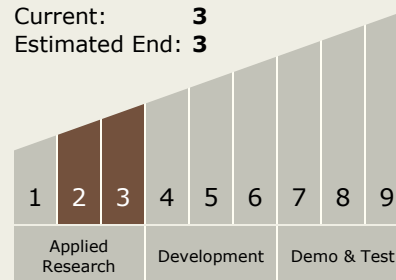
Robert P Damadeo

Co-Investigator:

Charles S Hill

Technology Maturity (TRL)

Start: 2
 Current: 3
 Estimated End: 3



Technology Areas

Primary:

- TX08 Sensors and Instruments
 - TX08.1 Remote Sensing Instruments/Sensors
 - TX08.1.1 Detectors and Focal Planes

Target Destination

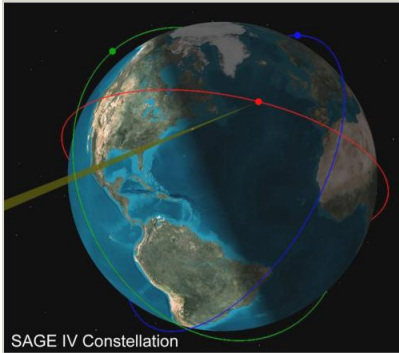
Earth

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Images



Project Image

SAGE IV Pathfinder

(<https://techport.nasa.gov/image/35788>)